Remarks

In response to objection to the drawings, a drawing sheet showing the required corrections in red is enclosed.

In response to objections to the specification because of informalities contained on page 3, line 22, and page 8, line 14, these lines are canceled and replaced with the new corrected lines presented above. In the CROSS-REFERENCE TO RELATED APPLICATION section on page 1, lines 5-8 are canceled and replaced with the new lines presented above, which provide the serial number, 09/577,174 of the co-pending, commonly assigned application whose disclosure is incorporated herein by reference.

Claims 1-11 have been rejected under 35 U.S.C. §112, first paragraph, on grounds that the best mode contemplated by the inventors has not been disclosed. This rejection is respectfully traversed. The Examiner has asserted that, based on the specification alone, it is not clear as to how or what type of bearing elements the applicants intend to form by the claimed method. The attention of the Examiner is respectfully directed to the specification at page 6, line 21, to page 7, which recites a hardened steel cylindrical bearing blank having face end surfaces, a lateral surface defining an outer diameter, and a centered circular bore whose surface defines an inner diameter. From this description of the bearing blank, it is clear that the bearing element formed by the claimed process is a bearing roller. In the interests of further clarity, the preamble of claim 1 is amended accordingly. The attention of the Examiner is also respectfully directed to the drawings included in the co-pending, commonly assigned application Serial No. 09/577,174, filed May 23, 2000 for COLD FORMED HIGH-LOAD BEARING STEEL PARTS AND PROCESS FOR FORMING SAME, whose disclosure is incorporated by reference in the instant application.

Claim 1 is further amended to recite that hard turning the inner surface of the bore to a specified inner diameter forms an inner bearing surface, and hard turning the lateral surface of the blank to a specified outer diameter forms an outer bearing surface concentric with the inner bearing surface, such bearing surfaces being characteristic of a cylindrical bearing roller.

Claim 9 has been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicants regard as the invention. As presented, claim 9 references itself, the result of an inadvertent inclusion in claim 9 of another claim that depends from claim 9. Claim 9 is now

amended to delete this second claim, which is now presented as new claim 12. Withdrawal of the §112, second paragraph, rejection of claim 9 is respectfully requested.

New claim 13, which recites that the hard turning of the lateral surface of the blank to a specified outer diameter is carried out in a single operation, is supported in the specification at page 7, lines 3-5, and page 9, lines 10-12.

New claim 14, which recites that the end face surfaces of the cylindrical blank comprise end surfaces of the cylindrical bearing roller, is supported in the specification at page 7, lines 5-6, and page 10, lines 3-4.

Claims 1-2 have been rejected under 35 U.S.C. §102(e) as being anticipated by Katsuki et al., U.S. Patent No. 6,019,517 ("Katsuki"). Also, claims 3-11 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Katsuki in view of Applicants' Admitted Prior Art (AAPA). These rejections are respectfully traversed.

Katsuki discloses the formation of two preformed pieces, one for a bearing outer-race having an internal raceway groove formed in an inner surface, the second for a bearing inner-race preformed piece having an external raceway groove formed in an outer surface (column 4. lines 24-35). Each of the Katsuki preformed pieces, which are intended to be used together with one another, includes a groove having a cross-section that comprises a flat portion flanked by curved portions, the groove being formed on the inner surface of the outer-race piece and on the outer surface of the inner-race piece. These grooves, one on each piece, constitute the bearing surfaces of a bearing comprising an outer and an inner race. By contrast, the cylindrical bearing roller of the present invention comprises inner and outer bearing surfaces that are concentric with one another.

FIG. 1A depicts a bearing outer-race preformed piece 1, whose profile is shown by the solid outermost line. The inner two-dot chain line depicts the profile of the product piece 6 following the removal of metal from all surfaces by a complex turning procedure that includes the formation of groove 7. Similarly, FIG. 2A depicts a bearing inner-race preformed piece 14, whose profile is shown by the solid outermost line, the inner two-dot chain line depicts the profile of the corresponding product piece 19 following the removal of metal from all surfaces.

By contrast to the procedure disclosed in Katsuki, the process of the present invention eliminates set-up, machining, finishing, and inspection steps, including the machining of the end face surfaces of the bearing roller, thereby reducing scrap and waste and lowering total production costs (cf. page 7, lines 5-9, and page 10, lines 3-9).

The foregoing discussion makes clear that the disclosure of Katsuki of a complex method of forming inner and outer races for a bearing neither anticipates nor renders obvious the simplified and economical process for forming a cylindrical bearing roller, as provided by the present invention. The deficiencies of the Katsuki teaching are not remedied by the AAPA. Withdrawal of the §102 (e) and 103(a) rejections of the claims is therefore respectfully requested.

Claims 1-14 are now in this case, whose prompt allowance is earnestly solicited.

Respectfully submitted,

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MARKED-UP COPY OF CLAIMS

1. (Amended) A process for forming a metal cylindrical bearing roller [bearing], said process comprising the steps of:

obtaining a hardened metal cylindrical blank having end face surfaces, a lateral surface defining an outer diameter, and a centered circular bore, said bore having an inner surface defining an inner diameter;

[a first] hard turning [step wherein] the inner surface of the bore [is turned] to a specified inner diameter, thereby forming an inner bearing surface; and

[a second] hard turning [step wherein] the lateral surface of the blank [is turned] to a [specific] specified outer diameter, thereby forming an outer bearing surface concentric with said inner bearing surface.

2. (Amended) The process of claim 1 wherein said [second step of] hard turning the lateral surface of the blank further includes [the formation of] forming a radial crown.

9. (Amended) The process of claim 1 wherein said hard turning said lateral surface is carried out using a computer numerically controlled (CNC) lathe. [The process of claim 9 wherein said lathe comprises a cubic boron nitride or ceramic cutting tool.]

12. (New) The process of claim 9 wherein said lathe comprises a cubic boron nitride or ceramic cutting tool.

13. (New) The process of claim 1 wherein said hard turning the lateral surface of the blank is carried out in a single operation.

14. (New) The process of claim 1 wherein said end face surfaces of said cylindrical blank comprise end face surfaces of said cylindrical bearing roller.